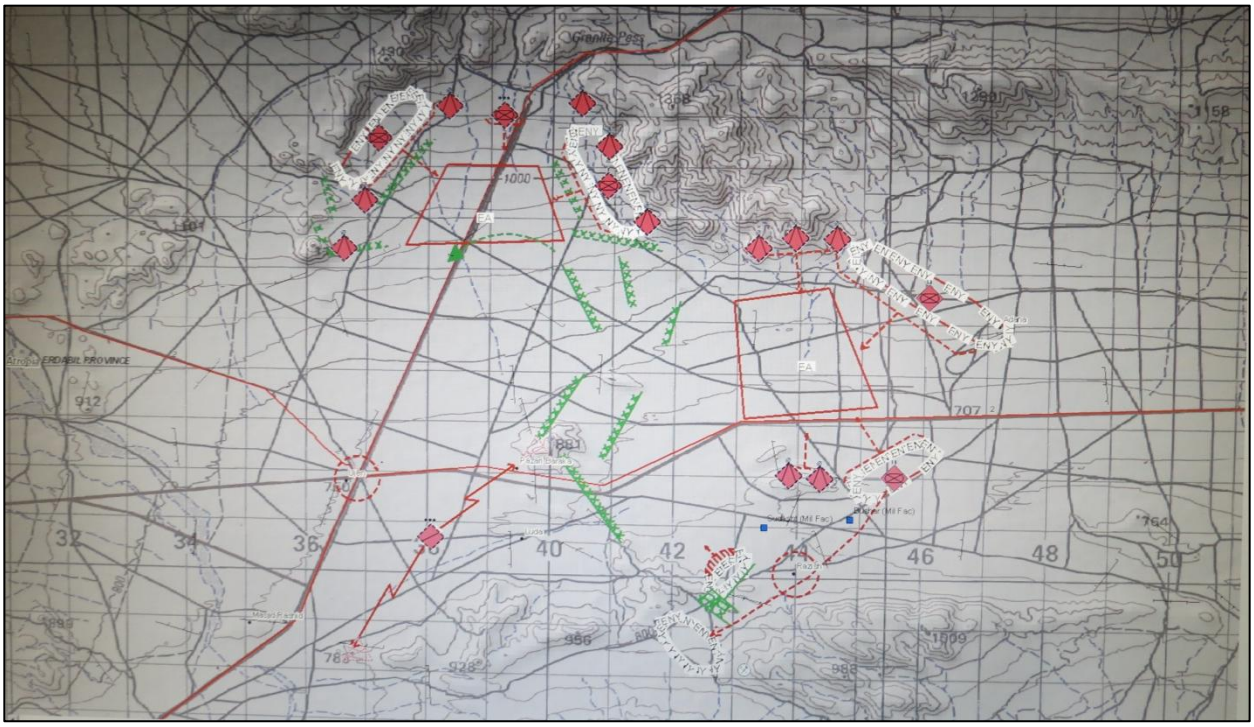
Successful Employment of DCGS-A to Enable the Commander's Decision Making Process



DCGS-A Multi-Function Work Station screen capture depicting Enemy SITTEMP and Reporting from 2nd Brigade 4th Infantry Division's NTC Rotation 13-08

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Foreword _____

Throughout the history of armed conflict, military commanders have wrestled with the difficulties of what we currently call Mission Command. The tenants, components, and philosophy of this aspect of warfare have varied over the years but the core dilemma has remained relatively constant: how to create shared understanding and purpose in a large diverse organization. Continual improvements in military hardware and software technologies have presented the opportunity to use the advances in the science of control to better address this dilemma – particularly in a geographical dispersed formation on the move.

In 2nd Brigade Combat Team, 4th Infantry Division, we took advantage of a welcome confluence of training and experience on the part of subordinate commanders, technical expertise in our staff, and adequate training time and resources to deliberately focus on applying the capabilities of the Army Battle Command Systems to this problem. In particular, we sought to improve the ability of commanders throughout the BCT to understand, visualize and then describe all aspects of the operational environment: terrain, friendly, enemy, etc. For this purpose, we spent a great deal of time and energy to realize the full capability of the BCT's digital systems. In essence, we sought to become a "digital" unit not just digitally equipped.

One of the strongest successes in this effort was our ability to link the Intelligence digital systems to the Maneuver digital systems across the Brigade Combat Team. This was especially significant in our ability to connect from the upper tactical internet to those systems on the lower tactical internet through our terrestrially-based FBCB2 systems. Accomplishing this allowed us to share data while on the move – an essential and illusive aspect of modern mission command. In essence, leaders at all levels had near instantaneous access to SITEMPS, SPOTREPS, and analyst assessments across the BCT footprint.

While we still have room for improvement, the significant accomplishments of the Warhorse Brigade in leveraging the organic digital capabilities were a large component of our success at the National Training Center.

Omar Jones
COL, IN
Commanding

Introduction

This summary focuses on 2/4 ABCT's successful use of DCGS-A during Decisive Action (DA) and Wide Area Security (WAS) training in preparation for the Theater Response Force mission Spartan Shield. The purpose is to highlight how the Warhorse Brigade capitalized on DCGS-A's tools, products, and capabilities to increase the Commanders' Common Operational Picture (COP) and situational awareness. The Warhorse Brigade's successful use of DCGS-A was the result of tenacious work from the FSRs, Embedded Trainer, and our Intelligence Tech during unit level reset specifically, Mission Command System Integration Team Events I and II at Wilderness Training Area, Brigade Field Training Exercise (FTX) at Pinion Canyon Maneuver Site (PCMS) and National Training Center rotation 13-08. Incorporation of DCGS-A throughout the training plan required "buy in" from all the Commanders. Initially, it was a challenging sell. However, once the benefits of the system became evident support increased. Fortunately, Commanders encouraged an aggressive approach to intelligence collection and the use of all available digital systems. This nature reinforced our insistence on using the system to maximize our capabilities.

Numerous Field Support Representatives (FSRs), DCGS-A Embedded Trainers, Military Intelligence and Signal Corps Warrant Officers, and patient Commanders played an integral part in establishing the systems and network architecture. DCGS-A reduced the overall tactical risk throughout the Brigade's battlespace by providing the BCT Commander with the tools to visualize, analyze, and understand the threat. This resulted in the Warhorse Brigade leveraging vast amounts of analyzed data, at various classification levels, disseminated to all Commanders throughout the ABCT.

During the 2nd Armored Brigade Combat Team (ABCT) 4th Infantry Division National Training Center (NTC) Decisive Action Training Environment rotation 13-08, the Brigade Intelligence Support Element successfully employed the Distributed Common Ground System-Army (DCGS-A) for dissemination of Graphics and Correlated Enemy Data on both Upper Tactical Infrastructure and Lower Tactical Infrastructure. This is the first successful employment of the capability at the National Training Center by a rotational unit and validated multiple DCGS-A system capabilities.

Efforts to accomplish these achievements began months earlier during unit collective training events. The Brigade's Field Training Exercise at Colorado's Pinion Canyon Maneuver Site allowed the unit to identify configuration and coordination requirements between Intelligence (S2) and Communication (S6) sections, system capabilities, and additional training tasks objectives during the unit's NTC rotation. It validated the DCGS-A suite of intelligence systems enabling the Commander's decision-making process on both the Upper Tactical Infrastructure and the Lower Tactical Infrastructure at all tactical echelons through robust communications architecture.

System capabilities and description - The DCGS-A Commander's Handbook describes the DCGS-A as the "Army's primary intelligence system deployed across the Army in support of ground Army commanders. It is the Army's primary intelligence system for ISR (intelligence, surveillance, and reconnaissance) Tasking, Processing, Exploitation, and Dissemination (TPED). DCGS-A is the intelligence flagship system of today and tomorrow that enhances the BCT Commanders understanding of the battlefield by reducing risk through improved Situation Awareness and provides access to data and information. DCGS-A is the enabler for all intelligence operations at all echelons from the Company Intelligence Support Team (CoIST) to national levels. DCGS-A provides a significant evolutionary opportunity and philosophy to reduce risk and improve intelligence support to Army commanders through flattened, timely access to the vast enterprise of ISR data and information."[1]

2/4 ABCT specific version information – 2 ABCT 4 ID operated DCGS-A version 3.1.6 SP 2 on SIPRNET and an Enhanced Position Location Reporting System based Force XXI Battle Command Brigade and Below (FBCB2) tactical network throughout the entire training cycle. This began in May 2012 during unit reset, through Combined Arms Maneuver (CAM) training at Pinion Canyon Maneuver Site (PMCS), and NTC rotation 13-08. During NTC, the unit elected to use organic DCGS-associated equipment rather than requesting NTC issued DCGS-equipment.[2] Network specific hardware consisted of the following:

- One Intelligence Processing Center (platform formerly known as the Analysis Control Team – Enclave or ACT-E) with two separate ISR Fusion Servers (IFS)
- 10 Portable Multi Function Workstations (BDE Intelligence Surveillance and Reconnaissance Integration Platoon)

[1] TCM Sensor Processing. *DCGS-A Commander's Handbook*. US Army, 2011.
[2] Appendix 1: Field Support Representative DCGS-A AAR.

- Two Portable Multi-Function Workstations (BDE S2 Operations)
- Five Portable Multi-Function Workstations (BDE S2 Plans)
- Two – Three Portable Multi function Workstations (Each subordinate BN)

Although both Combined Arms Battalions (CAB) and the Armored Reconnaissance Squadron (ARS) were issued an ISR Fusion Server, the Battalions elected not to use their servers and instead established a SIPRNET connection to the BDE IPC using connectivity provided by authorized S6 equipment.[3] Field Support Representatives configured each Portable Multi Function Workstation, regardless of the role or echelon assigned, to connect to the SIPRNET ISR Fusion Server located in the Intelligence Processing Center for access to appropriate databases and server functions. Concurrently, Field Support Representatives configured the ISR Fusion Server using appropriate manuals to facilitate communication through the Publish And Subscribe Server and the Common Message Processor through the following applications:

- C2R
- Lumisoft Mail Server
- LDIF / LDAP import
- Interoperability Gateway
- Entity Extraction Tool
- Auto Plot Configuration

Training Progression – Following post deployment reset all available Warhorse Brigade Intelligence Analysts attended New Equipment Training events during November and December 2012. The emphasis of the training centered on the Soldier Training Package applicable to the version 3.1.6 SP2 of DCGS-A.[4] This training covered basic user functions and configuration however provided limited instruction on use of the Publish And Subscribe Server to transfer Graphics and Enemy Situational data from DCGS-A to other Army Battle Command Systems. Additionally, the training provided no instruction on passing messages from DCGS-A on the Upper Tactical Infrastructure to Force XXI Battle Command Brigade and Below (FBCB2)

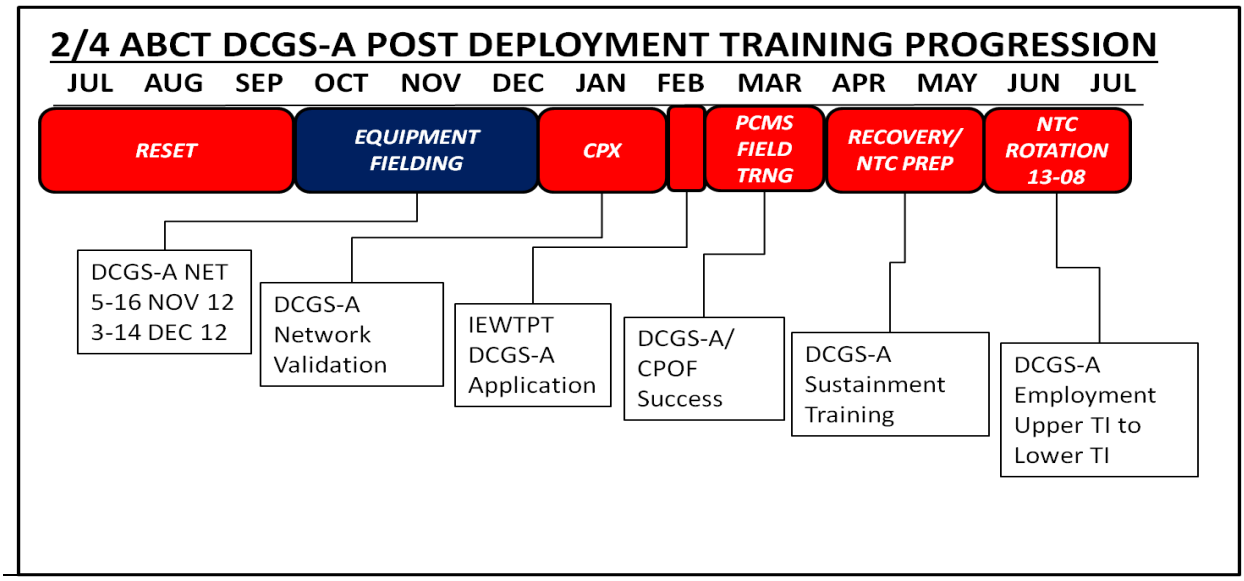

Fig 1: 2/4 ABCT Training Progression

[3] App GS-A AAR.

[4] PM-DCGS-A. *Soldier Training Package, DCGS-A v 3.1.6 SP2*. PM-DCGS-A, 2012.

platforms on the Lower Tactical Infrastructure. The communication infrastructure resident in the training facility influenced both issues listed above. Separately, training emphasized employment of the system in a Counter Insurgency (COIN) or Wide Area Security (WAS) scenarios, rather than supporting Combined Arms Maneuver (CAM). The Warhorse Brigade continued training with the DCGS-A platform in Feb 2013 during an event involving Brigade Analysts and the Military Intelligence Company. It allowed collaborative intelligence processing of HUMINT, SIGINT, IMINT and All Source Intelligence facilitated by the 4th Infantry Division Foundry site. The training introduced Intelligence Soldiers to Combined Arms Maneuver however; the exercise also identified the need to train all Intelligence personnel throughout the Brigade on the employment of DCGS-A. (Fig 1)

Exercise conditions for Pinion Canyon Maneuver Site - Field Exercise conditions at Pinion Canyon Maneuver Site consisted of approximately two weeks of Maneuver Company Situational Training Exercise lanes and one week of Combined Arms Maneuver lanes for each Combat Arms Battalion. The weather conditions during the exercise presented a significant challenge as the unit faced a blizzard and two winter storms, as well as an austere environment requiring organic network capabilities. A Wide Area Security Intelligence Scenario developed by the Training Brain Operations Center (TBOC) allowed incorporation of exercise information, enemy significant activity, and basic enemy data for Intelligence Analysts to exercise procedures and methods of analytical development throughout the exercise. The scenario allowed the Analysts to employ Intelligence Preparation of the Battlefield functionality of the DCGS-A, develop Enemy Situational Templates, and correlate data using the DCGS-A. Separately, a command decision to establish and utilize all exercise traffic and Army Battle Command System platforms on SIPRNET facilitated Upper Tactical Infrastructure communication. Ultimately, this command decision reinforced and emphasized the "train as we fight" mentality and established the foundation of digital efforts throughout Pinion Canyon Maneuver Site and NTC.

Data transferred to CPOF and Use of the Publish And Subscribe Server to transfer data on Upper Tactical Infrastructure - During exercises at Pinion Canyon Maneuver Site, the Brigade Intelligence Support Element successfully developed enemy graphics consisting of Doctrinal Templates, Situational, Named Area of Interest, and Event Templates. These overlays, developed through the Multi-Function Workstation 2D Map functionality, were sent through the Publish And Subscribe Server maintained by the S6 section on SIPRNET (Fig 2) and successfully plotted by S2 Operations and Plans personnel on the Command Post of the Future platform (CPOF). This action formed a fundamental step to enable the Brigade and subordinate Battalions initial transition from a "Digitally Capable Unit" to a "Digitally Operational Unit."

Additional considerations discovered during the development and transfer of these overlays was the requirement to use correct STANAG 2525B symbology resident in the symbol palette of the 2D mapping system rather than the drawing tools available to the MFWS. Failure to use the resident symbology resulted in rejected items in the Publish And Subscribe Server Topic

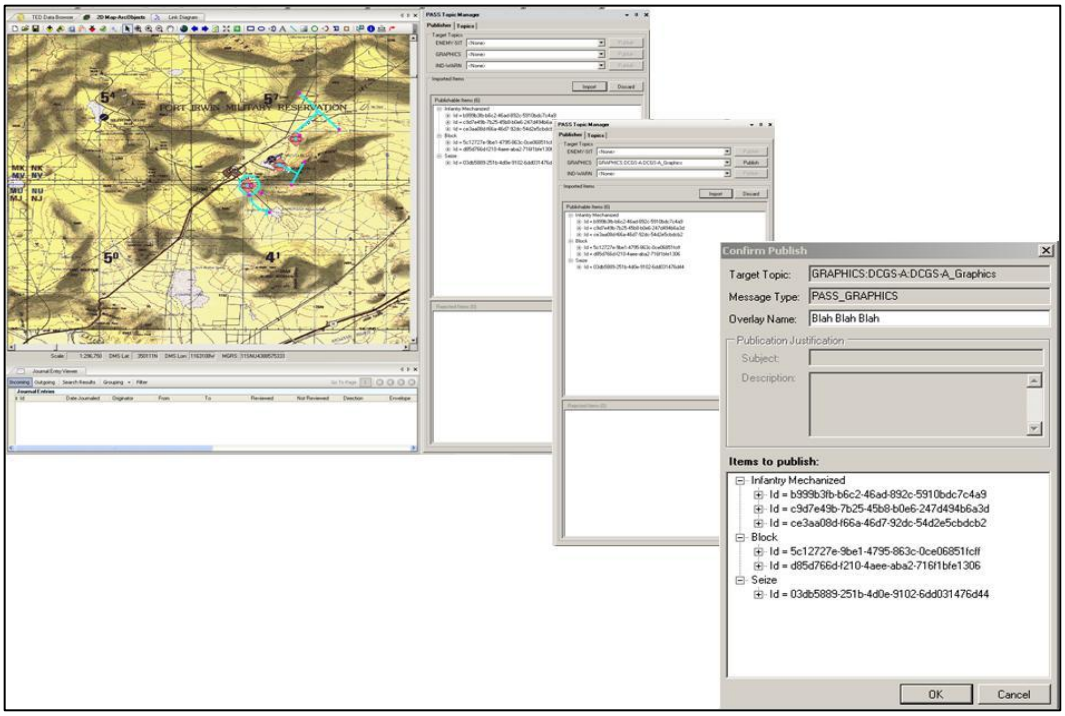

Fig 2: DCGS-A Publish And Subscribe Server Communications interface

Manager. Ultimately, the graphics drawn outside of the symbol palette did not transfer or display on other Army Battle Command Systems.
During the Combined Arms Maneuver portion of the exercise, the Brigade Intelligence Support Element utilized the symbol palette as a method to track enemy activity and movement. This method is ill advised as it only transmitted as a Graphic message, containing limited information, instead of an Enemy Situation Message that contains more detailed information derived from the Theater Entity Database.

Traffic only transmitted as a graphic message containing limited information rather than an Enemy Situation Message, which contained more detailed information derived from the Theater Entity Database. While each of these efforts focused on enabling the Commander's decision-making process at each tactical echelon, the Brigade Intelligence Warfighting Function identified that alternative communications methods must be employed if a Battalion lacked connectivity to the Brigade's Upper Tactical Infrastructure. This led efforts to identify software programs resident in the DCGS-A suite and develop procedures that would allow direct dissemination from DCGS-A platforms to each Battalion's organic Force XXI Battle Command Brigade and Below equipment on the Lower Tactical Infrastructure.

Exercise conditions for NTC - Exercise conditions for NTC consisted of Four days of RSOI, Eight days of Situational Training Lanes, Ten days of Combined Arms Maneuver / Wide Area Security,

and Eight days of recovery/ redeployment. During the Combined Arms Maneuver / Wide Area Security portion of the training, the Brigade conducted a deliberate defense, counter attack, and movement to contact. Concurrently, Wide Area Security training consisted of typical Counter Insurgency issues similar to those previously encountered in Afghanistan or Iraq integrated through a mutually supporting scenario with the Combined Arms Maneuver training.

Throughout the Situational Training lanes and the Combined Arms Maneuver portions of the rotation, Military Intelligence Company and BDE Analysts employed DCGS-A platforms in an austere environment to develop refined IPB products. These included detailed Situational Templates, Named Area of Interest Overlays, and Event templates to support the Military Decision Making Process.

Data transferred to Army Battle Command Systems - During the RSOI portion of the NTC rotation, Brigade Analysts, the MICO All Source Technician, and DCGS-A Field Support Representatives worked with Brigade Communications personnel to conduct a validation exercise to verify basic connectivity between all Portable Multi-Function Workstations, the ISR Fusion Server, and the network.[5] The validation exercise included all Brigade and most Battalion Intelligence leadership, Analysts, and DCGS-A Field Support Representatives to establish, develop, and maintain DCGS-A communications procedures across the formation. Hindsight showed the need to have all Battalion Intelligence soldiers and their hardware present. Guidance reflecting specific messaging requirements for DCGS-A was not thoroughly defined from NTC. Therefore, The Warhorse Brigade developed an ad-hoc requirement for DCGS-A to send and receive applicable messages to include, but not limited to Enemy Situation Messages and Graphics Messages through the Publish And Subscribe Server to other Army Battle Command Systems platforms. During this period, the Brigade successfully sent multiple Enemy Situation Messages, graphics including Named Area of Interest Overlays and Enemy SITTEMPs, to multiple Army Battle Command Systems platforms. This included the Advanced Field Artillery Tactical Data System, Air and Missile Defense Workstation, Command Post Of the Future, and

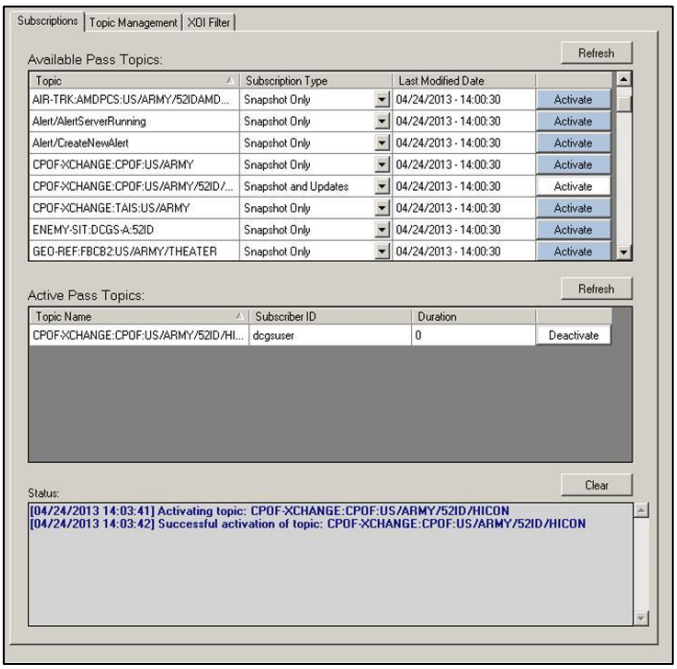

Fig 3: Publish And Subscribe Server Subscription Manager. *Allows users to identify, activate, and set update parameters to "pull" information into the Journal Viewer for display on MFWS.*

[5] Appendix 1: Field Support Representative DCGS-A AAR.

Tactical Airspace Integration System. This enabled each staff section to integrate Enemy Situation Templates into the planning process and allowed the Brigade Staff to refine operational plans and orders for the rotation. During the RSOI period, the transmission of these products from the Upper Tactical Infrastructure to the Lower Tactical Infrastructure (DCGS-A to Force XXI Battle Command Brigade and Below) was not exercised due to issues resulting from a fourth quarter Information Assurance update that interrupted the Java platform activation pathway. This update disabled the executable command for the Common Message Processor.

As the unit transitioned into Situational Training Lanes, personnel reestablished connectivity in an austere environment and prepared for Combined Arms Maneuver / Wide Area Security training. During this eight-day period, Analysts continued submission of messages through the Publish And Subscribe Server to Army Battle Command Systems and subscribed through the Publish And Subscribe Server subscription manager to messages from those same Army Battle Command Systems (Fig 3). Additionally, Analysts configured the Entity Extraction and Auto plot configuration interfaces of the MFWS to receive and display friendly graphics from other BDE systems. This allowed the Portable Multi-Function Workstations to receive and display friendly graphics transmitted from the Advanced Field Artillery Tactical Data System, Air and Missile Defense Workstation, Command Post Of the Future, and Tactical Airspace Integration System (Fig 4).

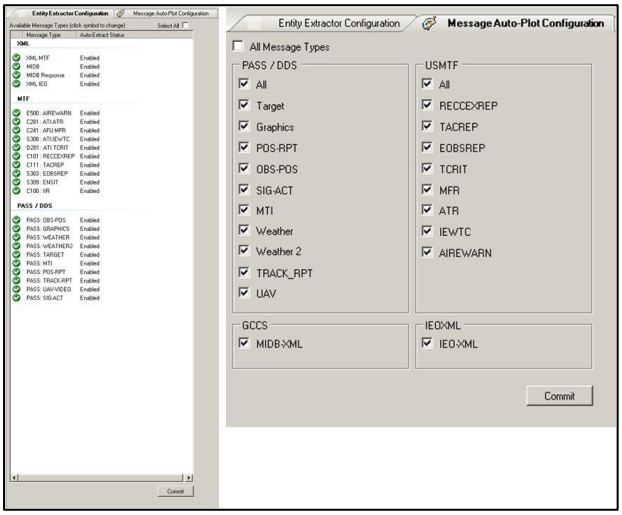

Fig 4: Entity Extraction and Message Auto Plot Configuration interface

Additionally, when Analysts subscribed to the appropriate Publish And Subscribe Server feeds, Force XXI Battle Command Brigade and Below (FBCB2) position reports and observation reports sent from the Force XXI Battle Command Brigade and Below network were extracted, displayed, and synchronized on each Portable Multi Function Workstation in the Brigade Tactical Operations Center. Approximately halfway through the rotation, 52 ID (NTC HICON) directed personnel operating Advanced Field Artillery Tactical Data Systems to switch from the Publish And Subscribe Server to the Division Data Distribution Service to facilitate transmission of 52 ID graphics between Brigade and Division Advanced Field Artillery Tactical Data Systems. This action effectively severed the ability to transfer graphics and Enemy Situation messages using the Publish And Subscribe Server between DCGS-A and Advanced Field Artillery Tactical Data Systems at the Brigade level.

Use of MFWS messaging to transfer data from the Upper Tactical Infrastructure to Lower Tactical Infrastructure - Field Support Representatives resolved the JAVA platform interruption issue and reestablished the pathway that allowed the Common Message Processor to activate during the closing days of Situational Training Lanes. This allowed Analysts to generate and

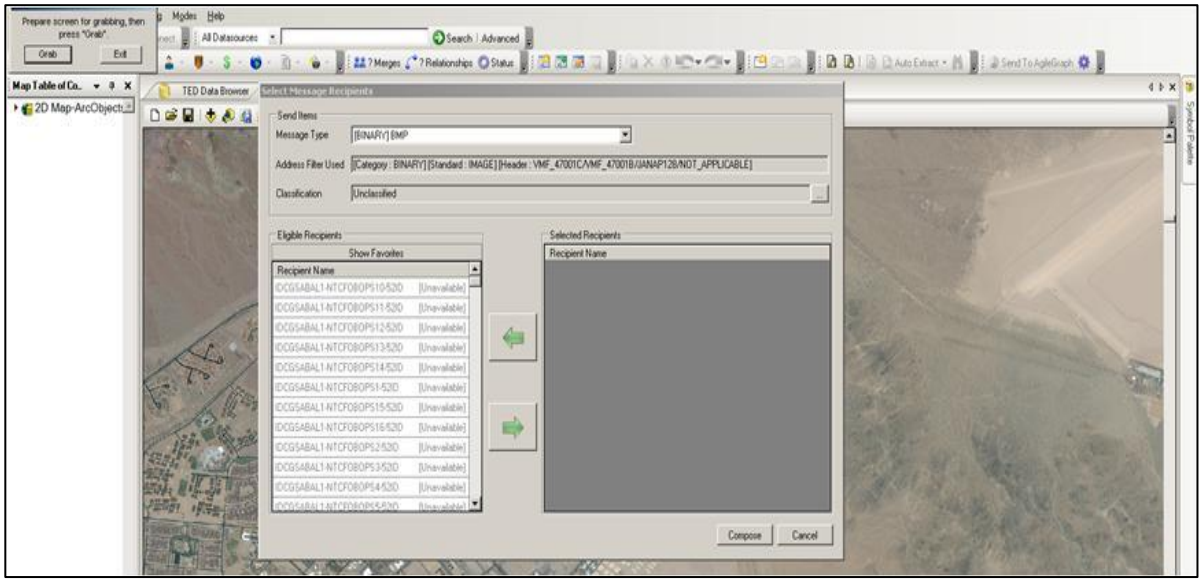

Fig 5: Message Processor Interface resident in the Multi Function Workstation. *Users access this tool by clicking on messaging toolbar,) Selecting message type and Addressee (s), Addressees are then transferred to Recipient Names, and message is composed or sent.*

send Variable Message Formatted data such as graphics, Freetext, and Entity Data Messages from Portable Multi Function Workstations to selected Force XXI Battle Command Brigade and Below platforms. Initial tests consisted of Freetext messages, Entity Data Messages, NAI, and Enemy SITTEMP graphics sent to the Brigade S2 Operations Force XXI Battle Command Brigade and Below to verify receipt and display of the products on an Force XXI Battle Command Brigade and Below system. Once verified, these messages were sent to various Force XXI Battle Command Brigade and Below Platforms resident in tactical vehicles across the Brigade formation and verified through Freetext message responses received by the DCGS-A Journal Entry Viewer (Fig7).

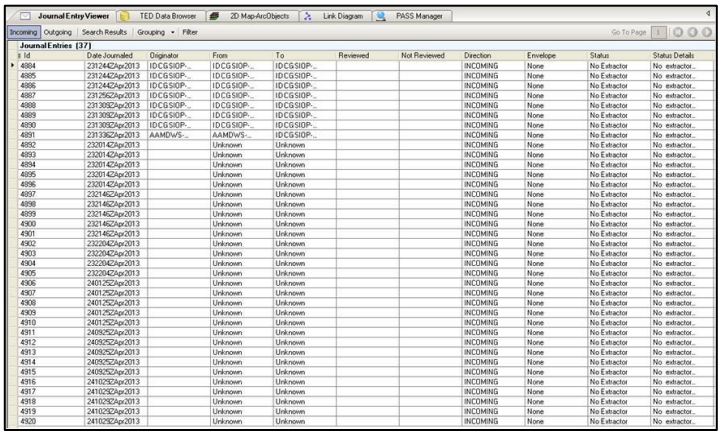

Fig 7: Journal Entry Viewer. *Users can select and "right click" on selected plotable messages to plot on 2D Map or view freetext messages from other sources.*

During the tests, Analysts discovered that the number of Force XXI Battle Command Brigade and Below platforms selected to transmit the data adversely effected the transmission speed of the data. To circumvent this

delay, internal protocols were established. They consisted of transmitting graphic messages to only the Brigade S2 Force XXI Battle Command Brigade and Below platform initially and then further transmission across the tactical footprint. Entity Data Messages were transmitted to the Brigade Force XXI Battle Command Brigade and Below platform manned by the Tactical Operations Center Radio Operator for transmission to subordinate units.

Although highly successful, the transmission of Enemy SITTEMP and NAI overlays resulted in some minor confusion. For example, some enemy graphics such as battle positions and operational graphic control measures displayed using only black colors and small text consisting of "ENY." Additionally, the development of these communication procedures and capabilities occurred in a relatively short time. This resulted in knowledge gaps and communication issues that presented a challenge for Portable Multi-Function Workstation operators and the Force XXI Battle Command Brigade and Below Operators. At times, Enemy SITTEMP graphics were not displayed due to the Force XXI Battle Command Brigade and Below Operator misunderstanding or error. Also, DCGS-A operators misunderstood the requirement to use the MFWS Journal entry viewer to view and plot incoming messages.

Identified Challenges - Additional challenges impeded the full utilization of DCGS-A communication capabilities. These originate from a lack of understanding across the Army of DCGS-A networking requirements, individual sustainment training on functionality, and Field Support Representative support. The single most severe impact to DCGS-A functionality observed was the failure of some units and organizations to segregate Portable Multi-Function Workstations into a separate Operator / User group protecting the platforms from automatic updates. These updates often stripped DCGS-A user accounts and Field Support Representative administrative accounts from each laptop rendering them ineffective. Additionally, S6 sections must enable Battalion Command Post Network Servers to recognize or allow Portable Multi-Function Workstations and DCGS-A IFS server's internet protocol addresses, as well as allow these addresses access to the network. A solution is the designation and training of an Army Battle Command Systems Knowledge Manager within all Army echelons from tactical to strategic. The Knowledge Manager needs to know the requirements and capabilities of each Army Battle Command Systems including required updates and communication methods.

Second, Intelligence analysts attended New Equipment Training approximately six to seven months prior to the NTC rotation. However, Soldiers did not conduct sustainment training on the system. Their lack of training and consistent use of the system resulted in them failing to retain the basic functionality and knowledge of the system. An emphasis on digital training and sustainment training for low density Military Operational Specialties and Unit Staffs will mitigate DCGS-A user knowledge loss.

Finally, lack of consistent support from Field Support Representatives and Embedded Trainers restricts consistent use of the system. Fortunately, the Warhorse Brigade enjoyed full, unwavering, and energetic support from level one and level two Field Support Representatives throughout the training cycle. Peer to peer dialogue indicates a lack of support or contractor accountability. This adversely affects the unit's capability to perform the mission assigned.

Possible solutions to this issue include a detailed screening process to identify the most capable applicants and involving the supported unit in contractor performance evaluations.

Training recommendations - Employing additional training opportunities across the Army will enable full use of our digital systems. A four-tiered model that includes new equipment training, Advanced Equipment Training, Integrated Army Battle Command Systems Training, and Unit Sustainment training will encourage consistent use of the DCGS-A system. Additionally, units should identify platform subject matter experts for each Army Battle Command Systems and send them to applicable training (such as the currently suspended Master Analyst program for DCGS-A at Ft. Huachuca) to further enable unit capability and use of each digital system.

Training could initially occur utilizing a centralized, On-Post training facility that incorporates all Army Battle Command Systems platforms including the Force XXI Battle Command Brigade and Below. Units identify personnel requiring training on specific systems based on duty position and send them to a course allowing them to train on their selected systems. Training focus should concentrate on basic use of each system, transition to advanced training, and culminate with the integration of all systems in a Combined Arms Maneuver / Wide Area Security scenario requiring Soldiers to communicate between Army Battle Command Systems platforms on both Upper and Lower Tactical Infrastructures. Many of these training centers exist across the Army, however they are likely under-utilized and require a command emphasis in order to further develop these capabilities across the Army. Unit sustainment training should follow a similar track. As units prepare for deployment or Field Training Exercises, they incorporate Mobile Training Teams for equipment fielding and software updates.

Identification of subject matter experts enables units to identify individuals responsible for systems integration and identification of training requirements to develop the use of digital systems. Soldiers identified should attend specific training to enable knowledge proficiency and use of each system. The development and use of Additional Skill Identification codes will aid the assignment and personnel management of identified Soldiers across the Army.

Despite extensive contention that what the Warhorse Brigade attempted was not possible, the brigade successfully employed the DCGS-A network. The Brigade proved that the system works and is effective. It provided unparalleled situational awareness for Commanders and battalion staffs by providing the ability to transmit Enemy templates, enemy unit locations, and additional Intelligence from DCGS-A Portable Multi Function Workstations on the Upper Tactical Infrastructure to Tactical systems like the Force XXI Battle Command Brigade and Below. This gave the leaders the intelligence they needed to make decisions on the move and outside of their Tactical Operating Centers. It enabled the Commander's decision-making process at all tactical echelons in the event subordinate units were unable to establish Upper Tactical Infrastructure networks.

Ultimately, tenacious Soldiers and civilians contributed to the success. Reluctant commanders eventually embraced the system once they witnessed the benefits. All Commanders embraced

digital systems and encouraged aggressive intelligence collection. The unit's training plan incorporated multiple field exercises in austere environments allowing operators to test and adjust the system in deployment conditions. The plan required persistent use of the system that maintained operator knowledge. Finally, none of it was possible without reliable and consistent support from Field Support Representatives and Embedded Trainers, full coordination and cooperation between the Warhorse Brigade Intelligence and Communication Warfighting functions, patient Commanders, and persistent Soldiers and Officers.